

Testing for Lead Poisoning

Are we testing the right kids?

City of Atlanta 2005

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Objective

To assess lead testing of children at high risk for lead poisoning in the city of Atlanta

Rationale

- **Childhood Lead Poisoning**
 - **Adverse health effects: cognitive impairment, behavior disorders, seizures and death, etc**
 - **Risk factor also well known: old housing, poverty, etc**
 - **Children with blood lead levels (BLLs) ≥ 10 $\mu\text{g/dL}$ may have no symptoms**
 - **A blood lead test is the only way to know that a child has been exposed**
 - **Challenge is knowing which children are at risk and should be tested**

Georgia Lead Testing Guidelines

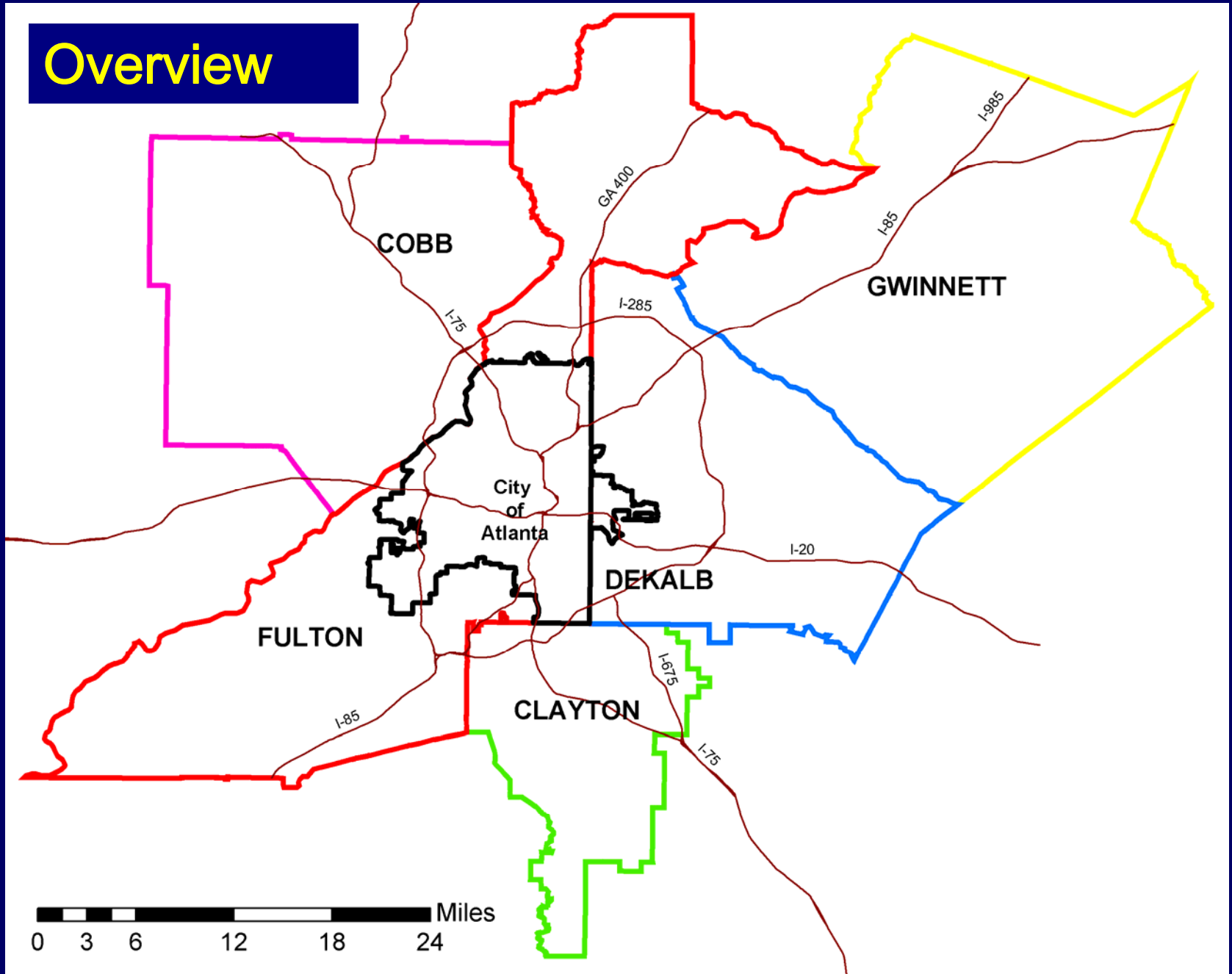
- **Risk should be verbally assessed for all children at 12 and 24 months of age**
- **Georgia children who should be tested:**
 - **their verbal assessment indicates risk**
 - **Medicaid/PeachCare for Kids/WIC eligible**
 - **reside in homes built before 1978**
 - **adopted from outside the United States**
 - **parents may be exposed to lead at work**

Neighborhood Risk

- **Risk for lead poisoning varies geographically**
- **Smaller geographic unit more accurate to assess risk**
- **Neighborhoods seem an ideal geographic resolution for assessing testing**
 - **Residents/physicians can easily identify their location by neighborhoods**

Metro Atlanta Area

Overview



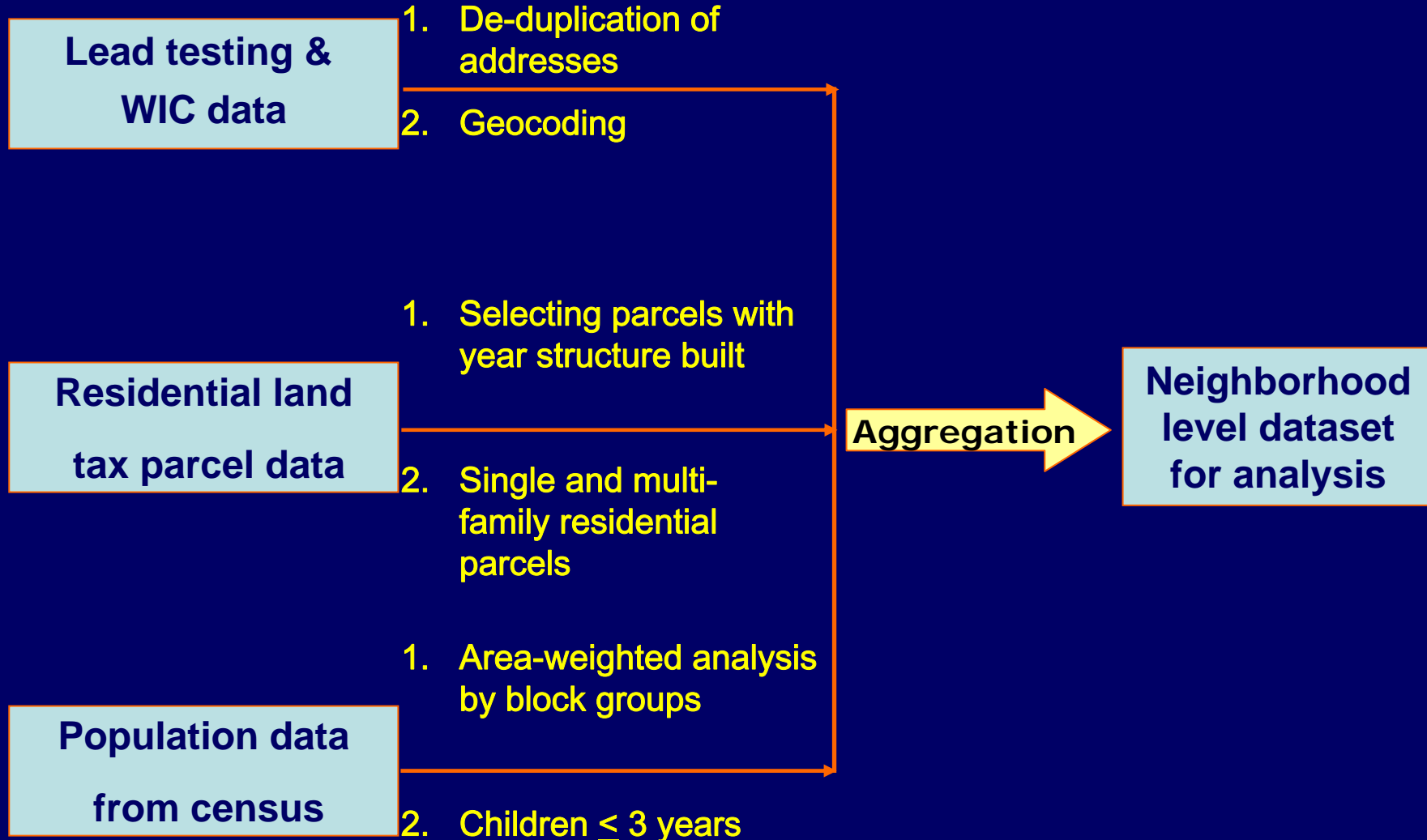
Methods: Datasets

- **Childhood blood lead , 2005**
 - **Aggregated, de-identified information by neighborhoods**
 - number of children tested for lead
 - number of children with elevated BLLs for children ≤ 3 years of age
- **WIC, 2005**
 - WIC data used as proxy for poverty
 - **Aggregated, de-identified information by neighborhoods**
 - number of children ≤ 3 years of age enrolled in WIC
- **Population, 2000**
 - Number of children ≤ 3 years of age from US Census

Methods: Datasets (continued)

- **Residential land parcel data**
 - Can have one or more housing units depending on type of property
 - Provided by Center for GIS , Georgia Tech.
 - Includes structure construction date, appraised value, land use information etc.

Methods



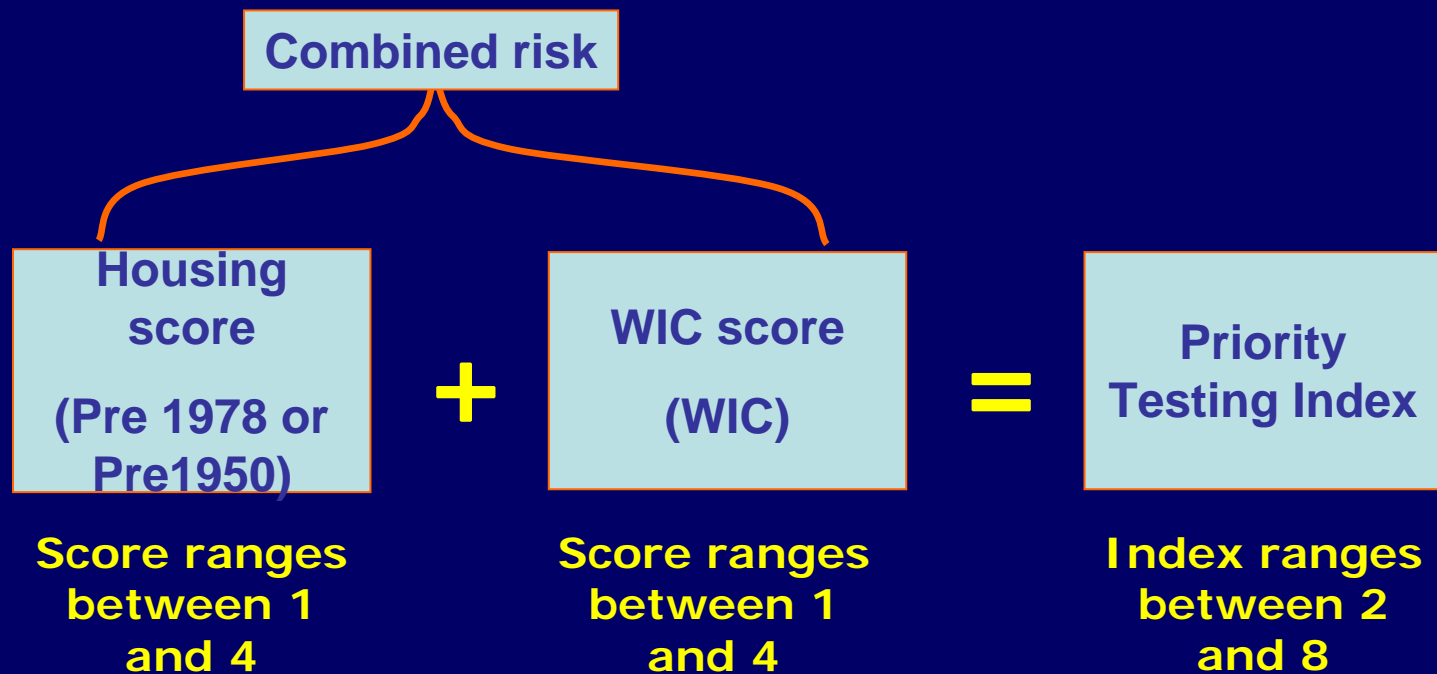
Methods: Neighborhood Risk

- **Created priority testing indices**
 - **To characterize risk by neighborhoods**
 - **Based on risk factors:**
 - % of Pre-1978 housing
 - % of Pre-1950 housing
 - % of WIC children
 - **Divided risk factors into percentile groups**
 - **Developed a scoring scheme to assign value to different percentile ranges of the risk factors**

Scoring Scheme for Priority Testing Index

Percent of Neighborhoods with Risk Factors			Percentile Groups	Risk Score
Pre-1978 housing	Pre-1950 housing	Children in WIC		
0-50 %	0 %	0 %	0-10 th	1
51-90 %	1-30 %	1-35 %	11 th -50 th	2
91-99 %	31-83 %	36-100 %	51 th -90 th	3
100 %	84-100 %	100 % + *	91 th -100 th	4

Priority Testing Index



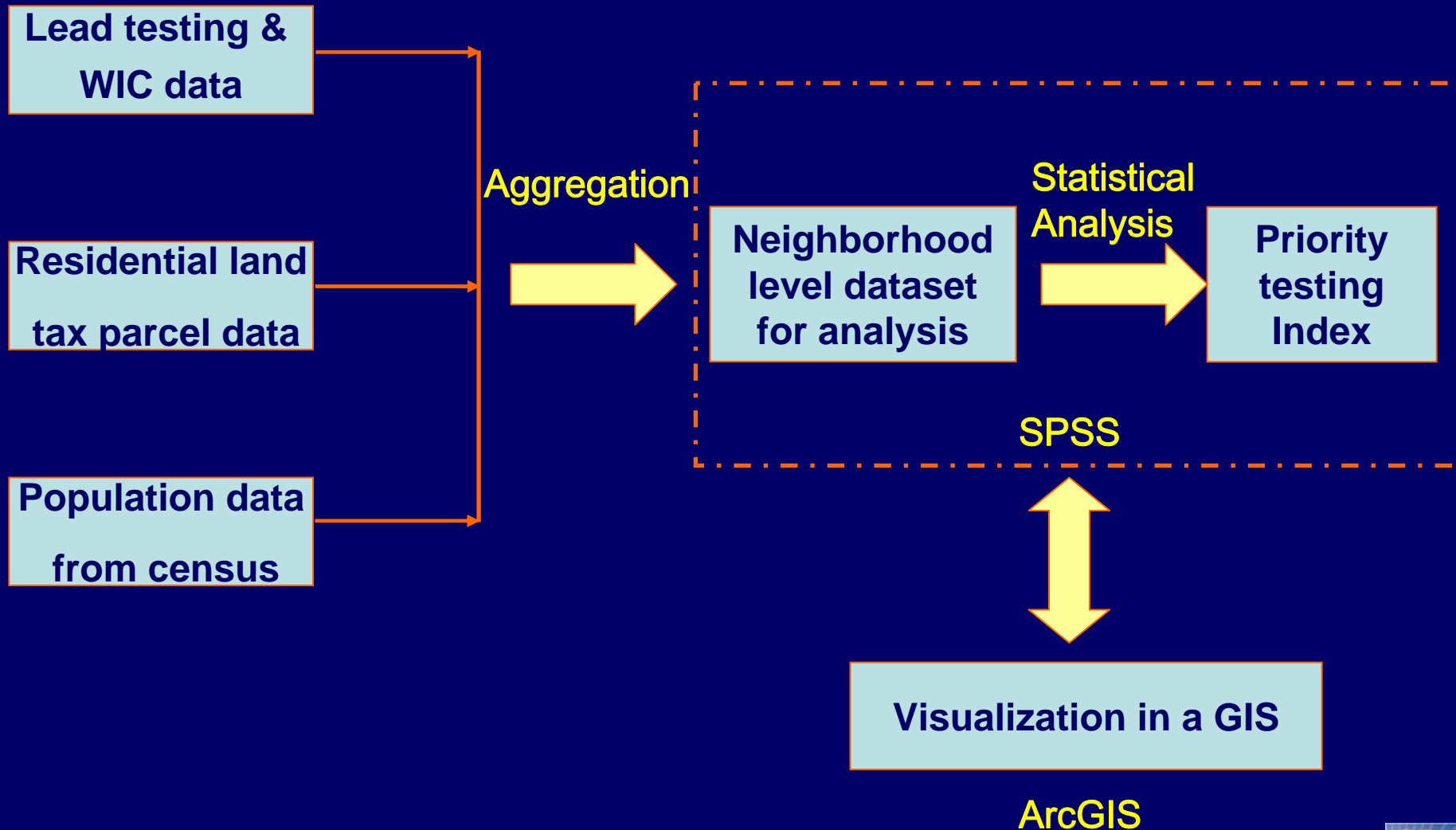
Priority Testing Index

- **Priority testing indices categorized further**

Priority Testing Index (Housing + WIC scores)	Risk Rating
2	Low
3 or 4	Low Medium
5 or 6	High Medium
7 or 8	High

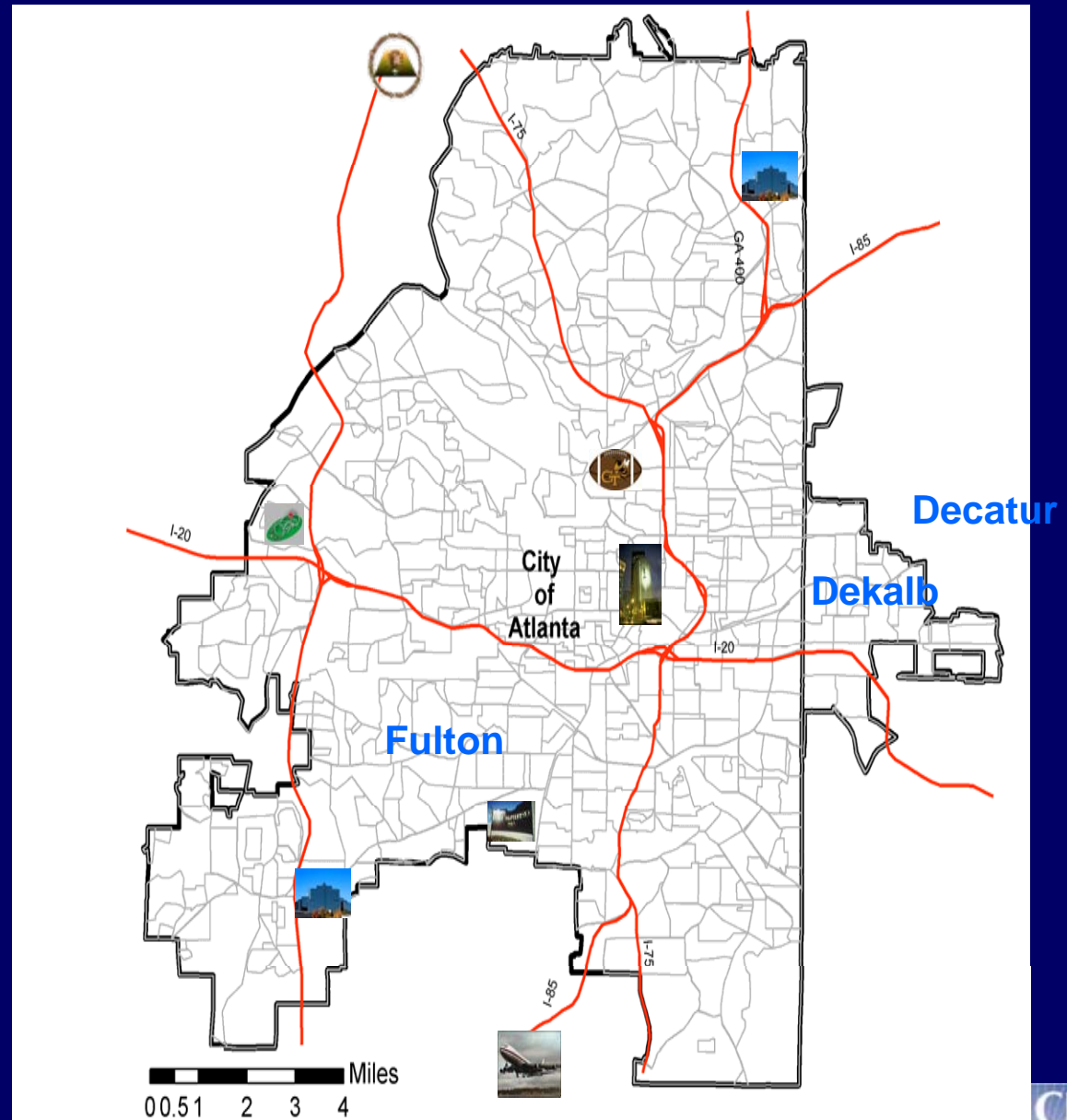
- **Calculated two priority testing indices**
 - **Pre 1978 and WIC**
 - **Pre 1950 and WIC**

Methods



Results

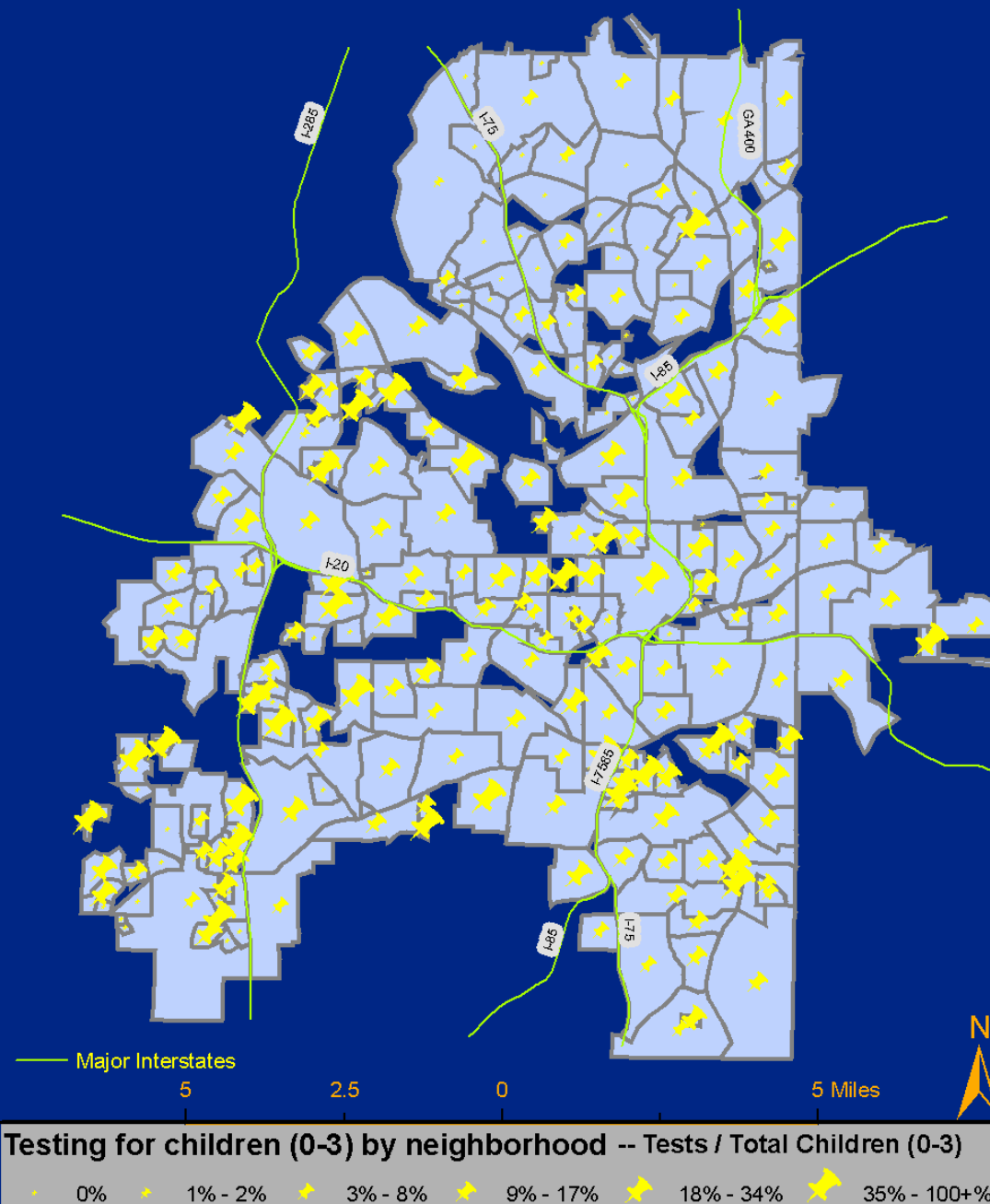
- **Demographics**
 - 236 neighborhoods in the city of Atlanta
 - 18,627 children aged (0-3) years



Results

- **Testing and WIC**
 - 2,231 children tested for lead
 - 23 children had BLL ≥ 10 $\mu\text{g}/\text{dL}$
 - 8,229 children aged (0-3) enrolled in WIC
- **Housing**
 - 84,055 residential parcels with year housing built
 - Of these 75,286 (89.6%) parcels were built before 1978
 - 47,142 (53.5%) residential parcels built before 1950

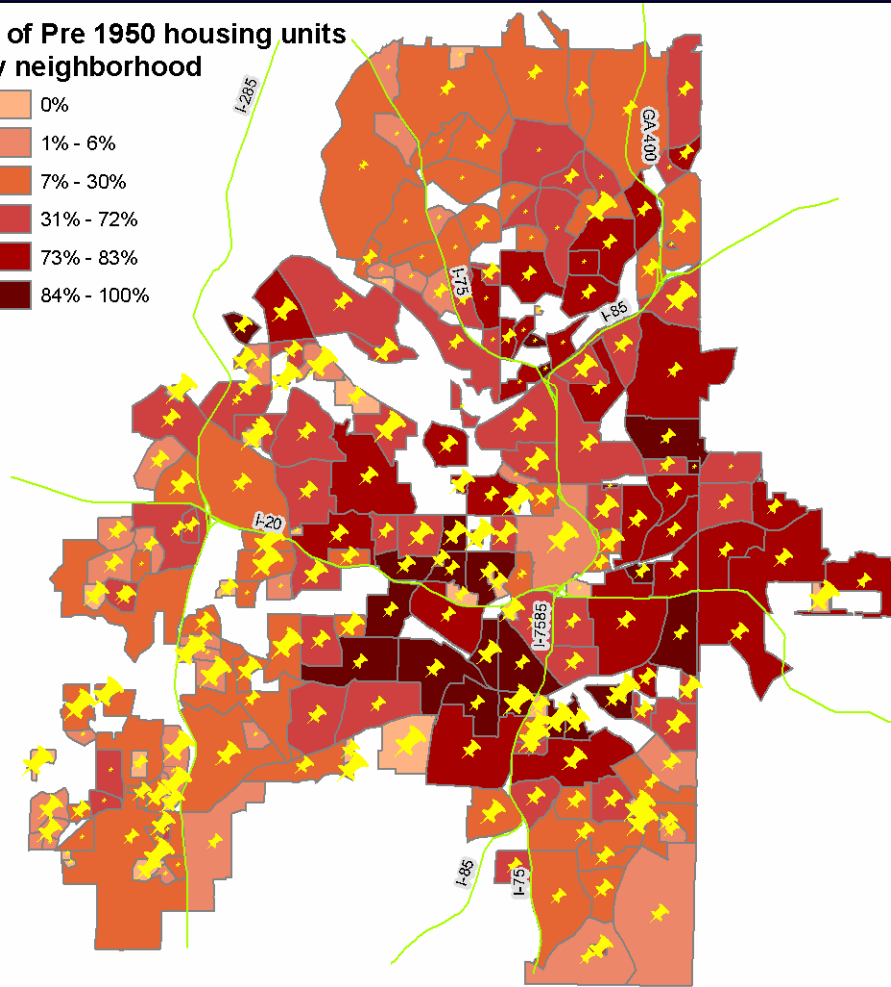
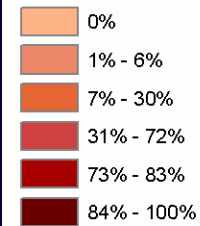
Percent of Children Tested by Neighborhood



- An estimated 39 children live in each neighborhood
- Of the 18,627 children in the City of Atlanta, 2,231 (11.9%) were tested for lead
- Of children tested, 23 (1%) had elevated BLLs
- Overall low testing

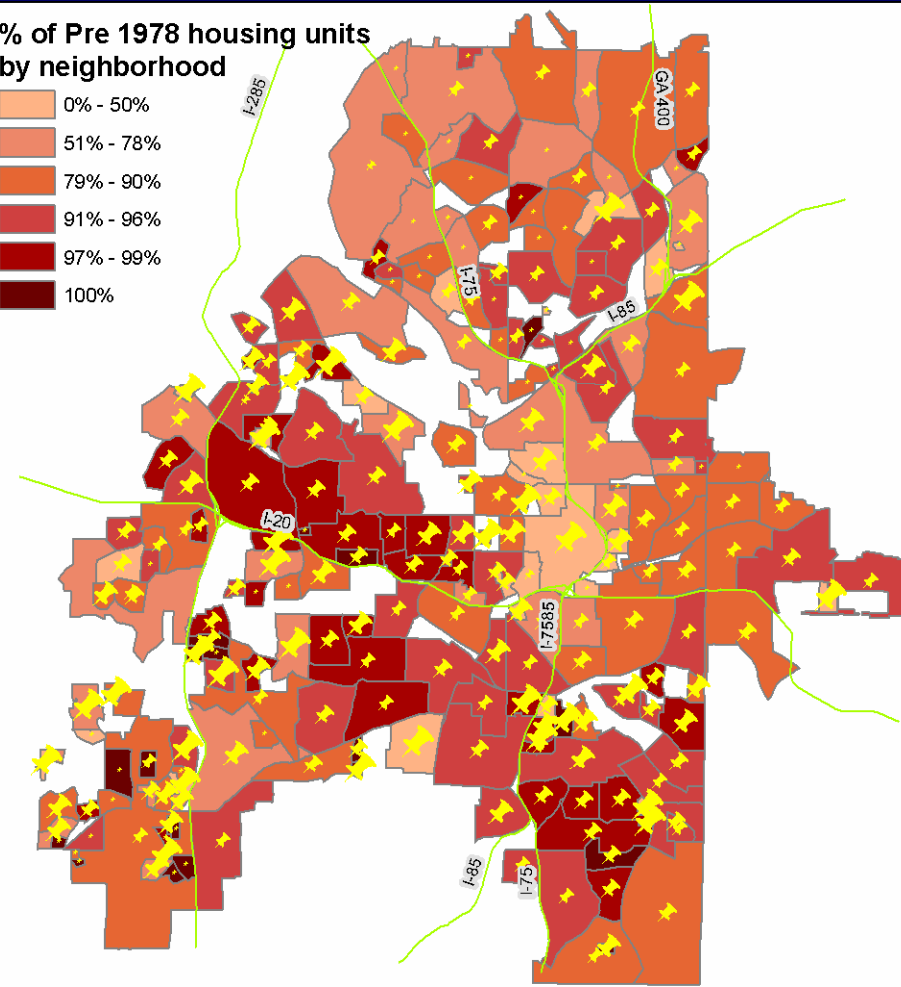
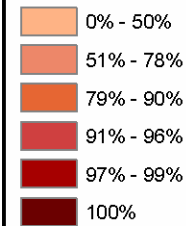
Results

% of Pre 1950 housing units by neighborhood



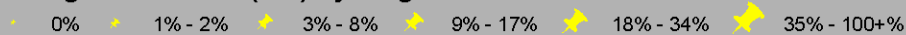
Major Interstates

% of Pre 1978 housing units by neighborhood



Major Interstates

Testing for children (0-3) by neighborhood -- Tests / Total Children (0-3)



5

2.5

0

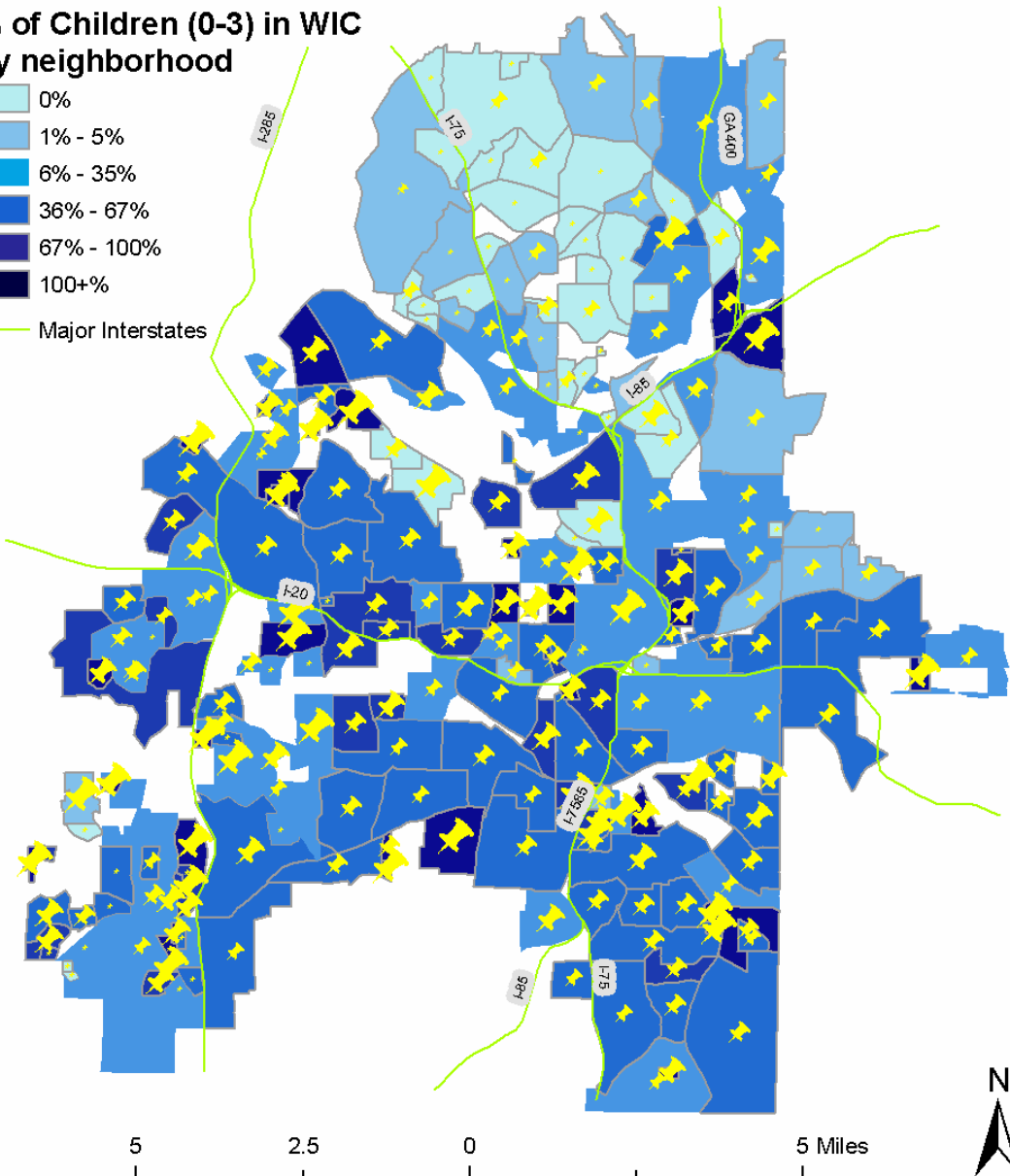
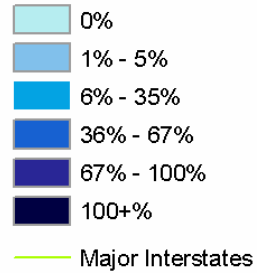
5 Miles



- Pre 1950 housing concentrated in central Atlanta
- Testing does not match housing risk

Percent of Children on WIC by Neighborhood

% of Children (0-3) in WIC
by neighborhood

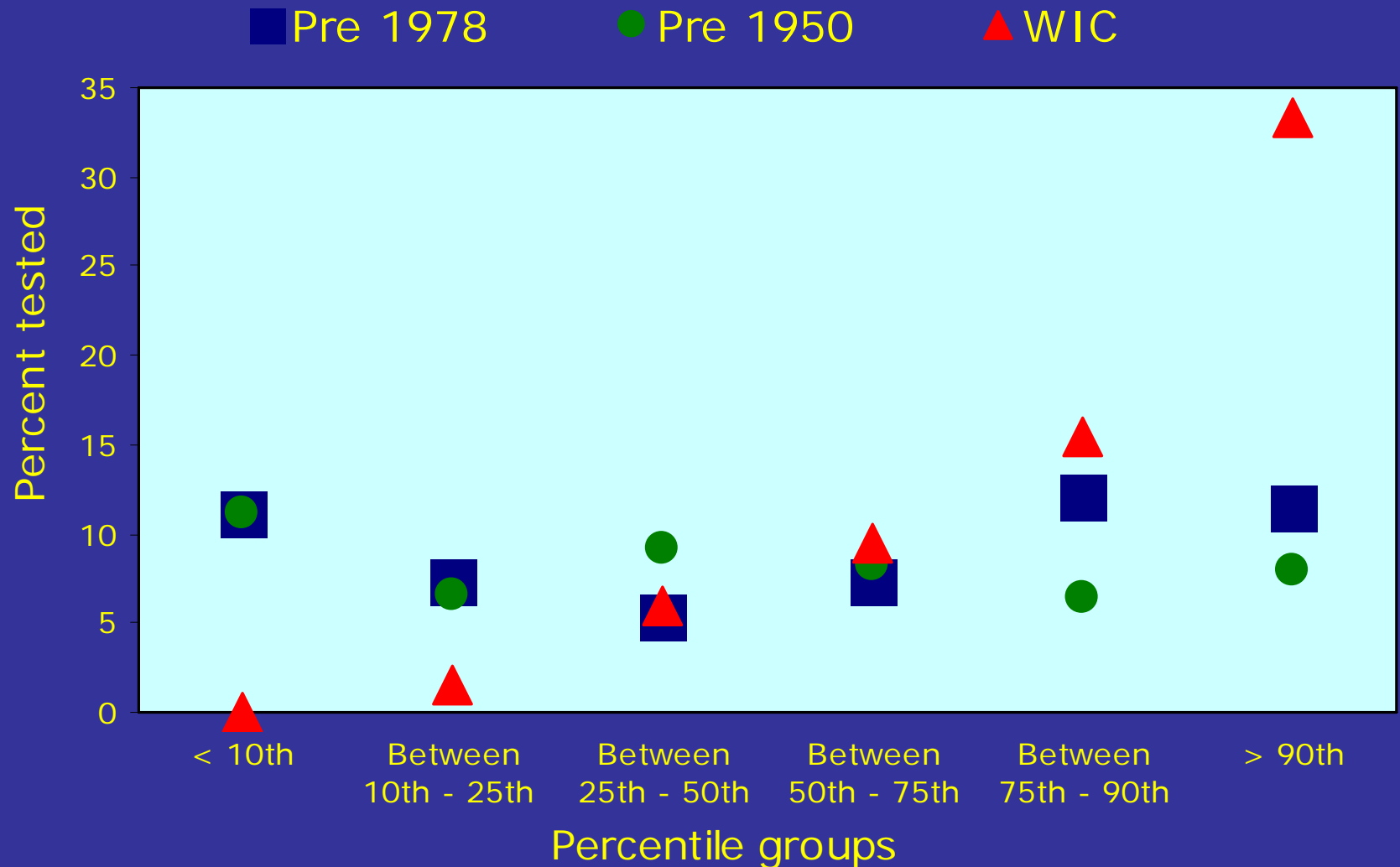


- Percentage of children in WIC increases from North to South
- Neighborhoods with high percentage of WIC children have higher testing

Testing for children (0-3) by neighborhood -- Tests / Total Children (0-3)



Results



- Testing increases as percent of WIC children increases
- Housing risk and testing do not follow clear trend

Results

Priority Testing Index (Housing + WIC scores)	Category Rating	Neighborhoods	
		Pre-1978 and WIC N (% of total)	Pre-1950 and WIC N (% of total)
2	Low	6 (2.5%)	6 (2.5 %)
3	Low Medium	22 (9.0%)	18 (7.6%)
4		62 (26.3%)	57 (24.2%)
5	High Medium	71 (30.1%)	82 (34.7%)
6		50 (21.2%)	54 (22.9%)
7	High	17 (7.2%)	15 (6.4%)
8		8 (3.4%)	4 (1.7%)
		Total: 236 (100.0%)	Total: 236 (100.0%)

- **More than 120 neighborhoods fall under high medium category**

Discussion

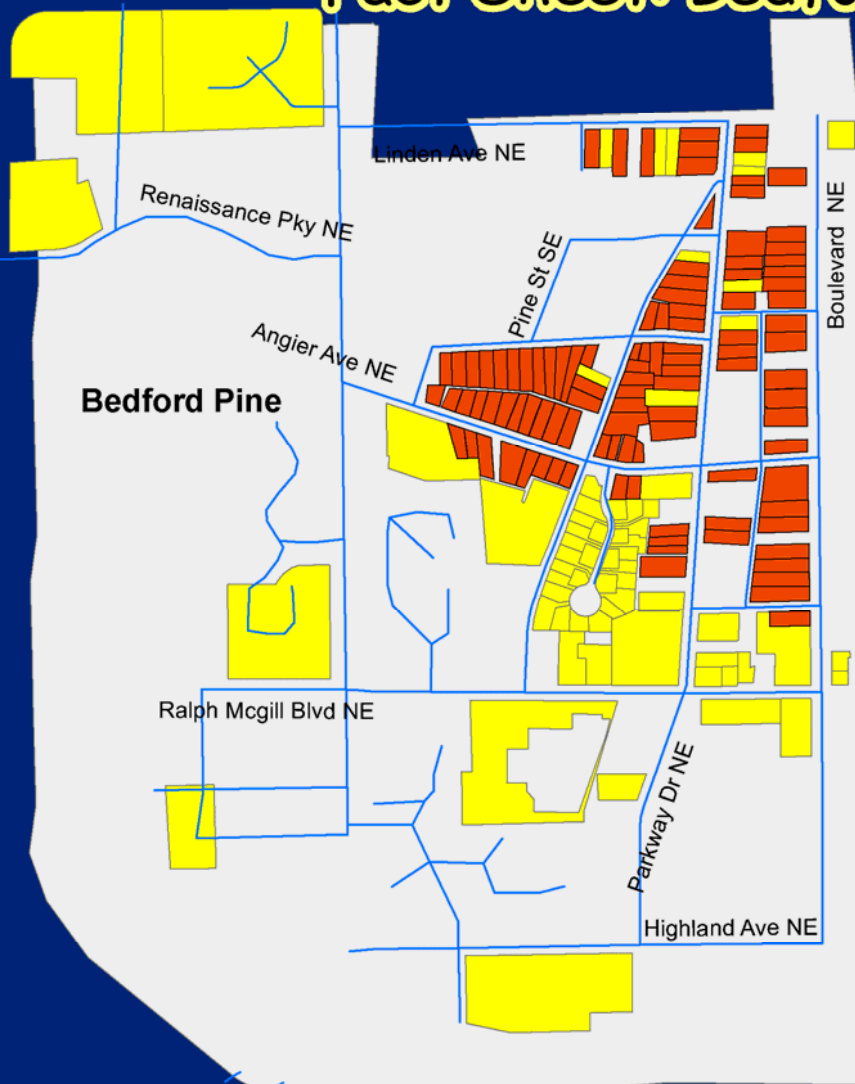
- **In general, testing reflects the numbers of WIC children and not housing risk**
- **Creating priority testing indices was an approach to characterize neighborhood risk**
- **Combining risk factors can improve risk assessment and ultimately testing**

Discussion

- **Dissemination of information about high risk neighborhoods can be accomplished by community-based organization**
- **Maps can help communities and providers identify children living in high risk neighborhoods**
- **Primary prevention strategies are key for achieving the 2010 goal of eliminating childhood lead poisoning**

Discussion

Fact Sheet: Bedford Pine Neighborhood



Lead screening

Number of screens in 2005: 73

Cases with elevated Blood lead level
(BLL \geq 10 ug/dL): 1

Blood lead screening rate: 30.41%

Demographic and Housing Information

of children aged (0-3) years: 172

of children enrolled in

Women Infant and Children (WIC): 133

Size of neighborhood: 0.4 sq. mile

Total # of residential parcels: 187

of Pre 1978 residential parcels: 133

Community information

Organizations:

1. Atlanta Downtown Neighborhood Assoc.

2. Central Atlanta Neighbors

of Pediatricians: 2

of Family Practitioners: 1



Strengths and Limitations

- **Strengths**

- Use of tax parcel data enables accurate assessment of housing risk
- Smaller geographic units recognized by residents, such as neighborhoods, are better suited for outreach

- **Limitations**

- datasets used in our analyses used data covering different times

Next Steps

- **Assess testing among children enrolled in Medicaid**
- **Reducing error in area-weighted analysis by using advanced GIS techniques.**
- **Translate methods of this study into a state-wide effort**

Conclusion

There is a need to increase testing of children living in old housing and in poor families.

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